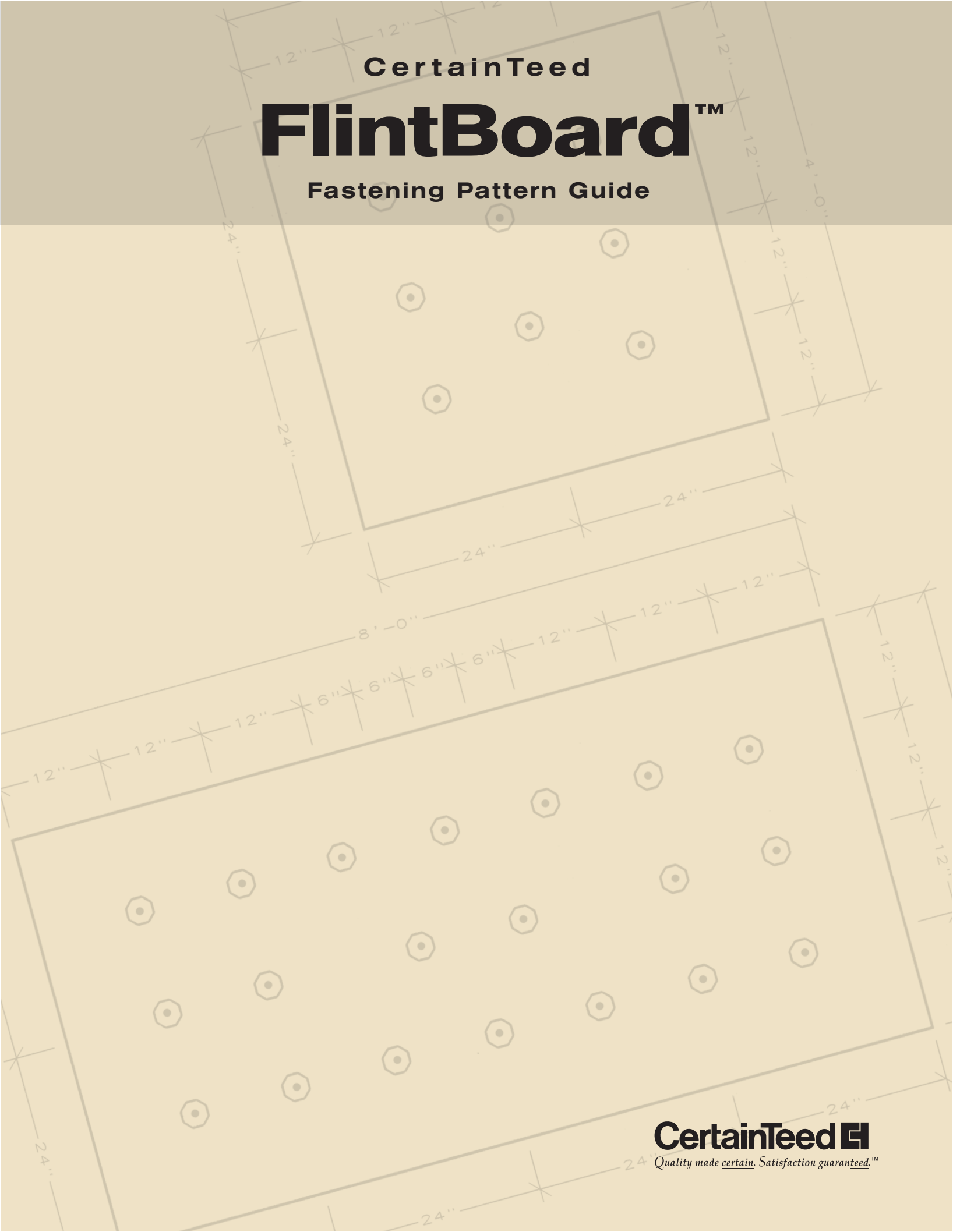


CertainTeed
FlintBoard™

Fastening Pattern Guide



In January of 2006, Factory Mutual updated Data Sheets I-28 and I-29 Design Wind Loads.

Listed below are the new requirements for perimeter and corner attachment for fully adhered roof systems Only as described by Factory Mutual Property Loss Prevention Data Sheet I-29.

Although FM I-90 guidelines may be specified in the contract documents, wind uplift calculations should be done to determine whether a more appropriate uplift pressure (I-60 or I-75) is better suited for that specific building and geographical location.

For areas where the recommended field of roof wind rating does not exceed Class 1-75 (75 psf, 3.6 kPa), and roof covers are adhered to some combination of mechanically fastened insulation, cover board, or thermal barriers, increase the number of fasteners per board over the FM Approved field-of-roof spacing by the following:

- **50% minimum in the roof perimeter, but at least one fastener per 2 ft @ (1 per .19 m²)**
- **100% in the roof corners, but at least one fastener per 1 ft @ (1 per .09 m²)**
- **Round up to the next whole number of fasteners**

For areas where the recommended field-of-roof wind rating exceeds Class 1-75 (75 psf, 3.6 kPa), ensure the roof system used in the perimeter and corner areas is FM Approved for the specific wind rating recommended in the perimeter and corner areas. Alternatively, install either a mechanically attached single-ply membrane or a multi-ply roof cover with a mechanically attached base sheet in accordance with 2.2.7.2.

CertainTeed FlintBoard™ Fastening Pattern Guide

Fastening Pattern C-1 and C-2 are the FM Approved fastening patterns for the field-of-roof area. According to FM, because of higher wind uplift forces in certain roof areas such as corners and perimeters, additional fasteners may be required. Geographical location, zone identity, or the presence of an air barrier may also change your fastener requirements. Check with your local FM engineer.

3

Corner and Perimeter Area Calculations...

The width of the roof corner and perimeter are defined as the smaller of:

1. 1 times the building lesser the plan dimension
2. .4 times the eave height
3. Subject to a minimum width of 4 ft.
4. Any whole or partial insulation board which falls within the calculated perimeter or corner should have the increased fastening applied over the entire board.

CertainTeed Fastening Guide Requirements

The following applies to any single layer of CertainTeed FlintBoard ISO insulation installed over a min. 22 gauge steel roof deck or a top layer of CertainTeed insulation fastened through a second layer of insulation. Other CertainTeed panel products include:

FlintBoard ISO (and ISO-T)

FlintBoard ISO CV

FlintBoard ISO WF (and ISO-T-WF)

FlintBoard ISO NB

FlintBoard ISO Plus (and ISO-T Plus)

FlintBoard ISO DD

FlintBoard ISO F

FlintBoard ISO Cold (and ISO-T Cold)

Built up & Modified Bitumen Roof System (FM Approved Steel Decks Only)

	Insulation Thickness	Fastening Pattern		
		Field	Perimeter	Corner
New Tear Off or Retrofit (Does Not Meet FM Class 1-90)	1.0" to 1.4"	C-1	C-1+50%	C-1+100%
New/Tear Off (Meets FM Class 1-90)	1.5" minimum	C-2	C-2 +50%	C-2 +100%
Retrofit FM Uplift Rated Only	1.5" minimum	C-2	C-2 +50%	C-2 +100%

CertainTeed Fastening Guide Requirements for FlintBoard ISO NB, Polyiso Bonded to OSB:

- Shingle roof system
- Tile roof system
- Shake roof system
- Standing seam metal roof system

	Insulation Thickness	Fastening Pattern
Plywood Roof Decks with Joists 16" oc	1.5" to 4.5"	NB-2
Plywood Roof Decks with Joists 24" oc	1.5" to 4.5"	NB-1
Tongue and Groove wood deck – 1" minimum	1.5" to 4.5"	NB-1
Steel Roof Decks	1.5" to 4.5"	NB-2
Concrete Decks	1.5" to 4.5"	NB-1

CertainTeed Fastening Guide Requirements for FlintBoard CV:

Standard fastening pattern for slopes up to and including 7:12 (18 per board).

Increase fastening pattern for 8:12 and over (24 per board).

If using FlintBoard ISO DD:

Contact CertainTeed Technical Department for the appropriate fastening pattern.

C-1 Roof System Field-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems (not FM Class 1)

For insulation thicknesses less than 1.4".

Mechanically Fastened BUR, Modified Bitumen and Fully Adhered Single Ply Systems (not FM 1-90)

For 1" thick insulation installed over a dry, flat continuous substrate – retrofit.

Notes

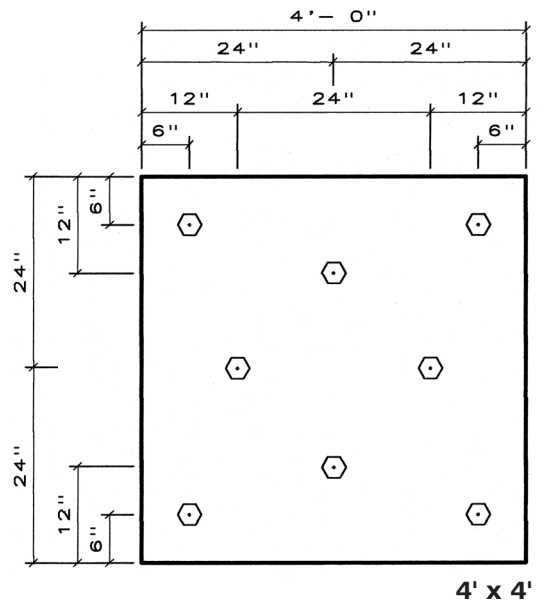
- Fasteners/Plates must be Factory Mutual Approved.
- 1 fastener per 2 square feet.

Deck Types

Steel – 22 Gauge Minimum
Structural Concrete
Cementitious Wood Fiber
Gypsum
Wood

CertainTeed Products

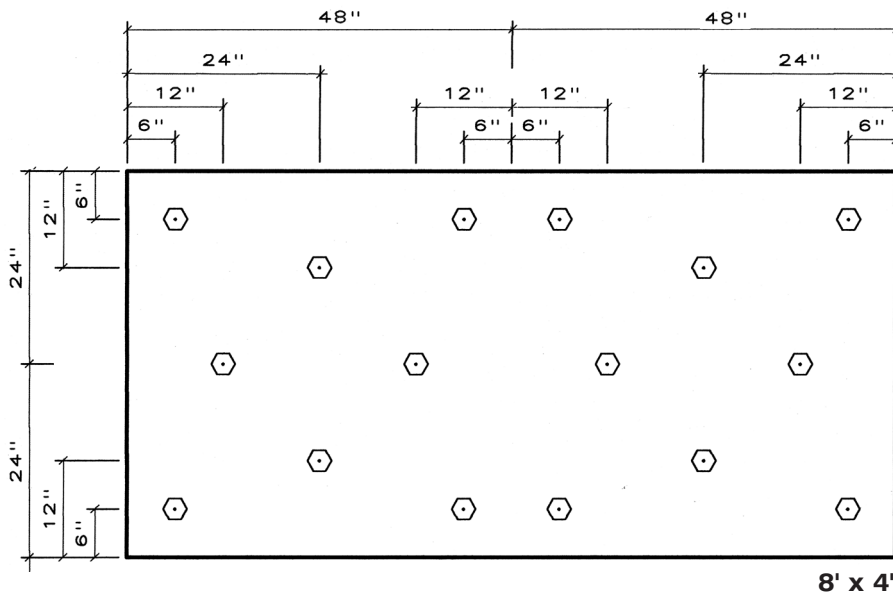
FlintBoard ISO (and ISO-T)
FlintBoard ISO WF (and ISO-T-WF)
FlintBoard ISO Plus (and ISO-T Plus)
FlintBoard ISO F
FlintBoard ISO CV
FlintBoard ISO NB
FlintBoard ISO DD
FlintBoard ISO Cold (and ISO-T Cold)



4' x 4'

Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



8' x 4'

C-1 + 50% Roof System Perimeter-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems (not FM Class 1)

For insulation thicknesses less than 1.4".

Mechanically Fastened BUR, Modified Bitumen and Fully Adhered Single Ply Systems (not FM 1-90)

For 1" thick insulation installed over a dry, flat continuous substrate – retrofit.

Note

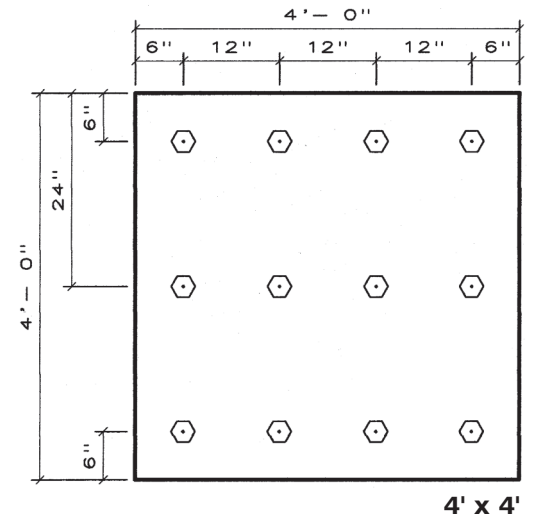
Fasteners/Plates must be Factory Mutual Approved.

Deck Types

- Steel – 22 Gauge Minimum
- Structural Concrete
- Cementitious Wood Fiber
- Gypsum
- Wood

CertainTeed Products

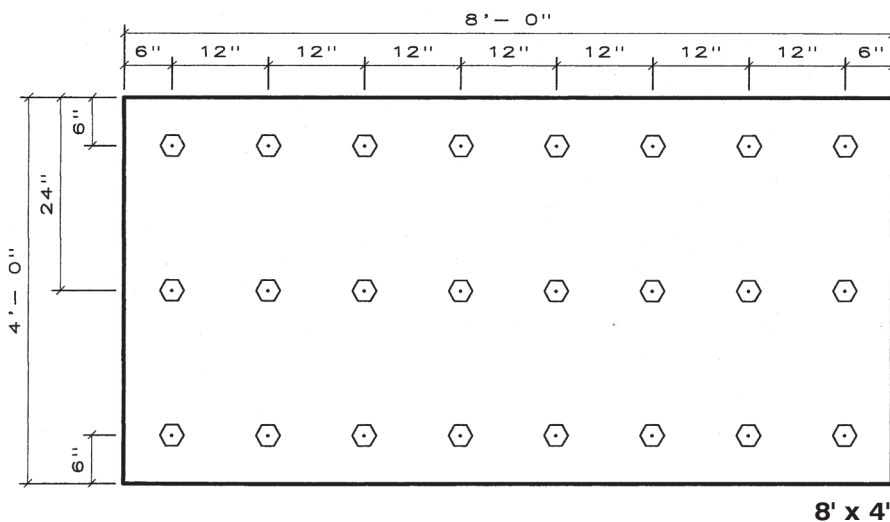
- FlintBoard ISO (and ISO-T)
- FlintBoard ISO WF (and ISO-T-WF)
- FlintBoard ISO Plus (and ISO-T Plus)
- FlintBoard ISO F
- FlintBoard ISO CV
- FlintBoard ISO NB
- FlintBoard ISO DD
- FlintBoard ISO Cold (and ISO-T Cold)



4' x 4'

Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



8' x 4'

C-1 + 100% Roof System Corners-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems (not FM Class 1)

For insulation thicknesses less than 1.4".

Mechanically Fastened BUR, Modified Bitumen and Fully Adhered Single Ply Systems (not FM 1-90)

For 1" thick insulation installed over a dry, flat continuous substrate – retrofit.

Note

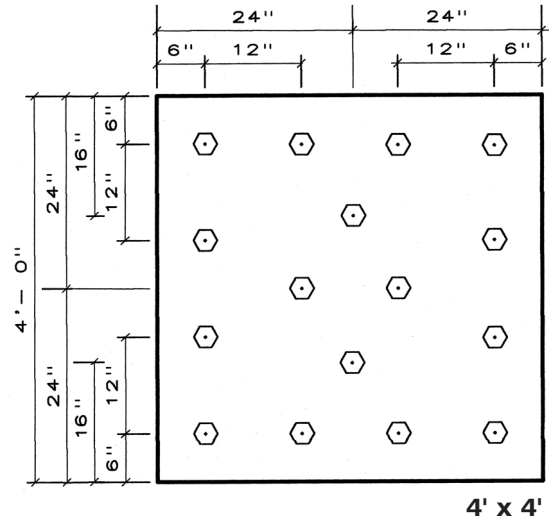
Fasteners/Plates must be Factory Mutual Approved.

Deck Types

- Steel – 22 Gauge Minimum
- Structural Concrete
- Cementitious Wood Fiber
- Gypsum
- Wood

CertainTeed Products

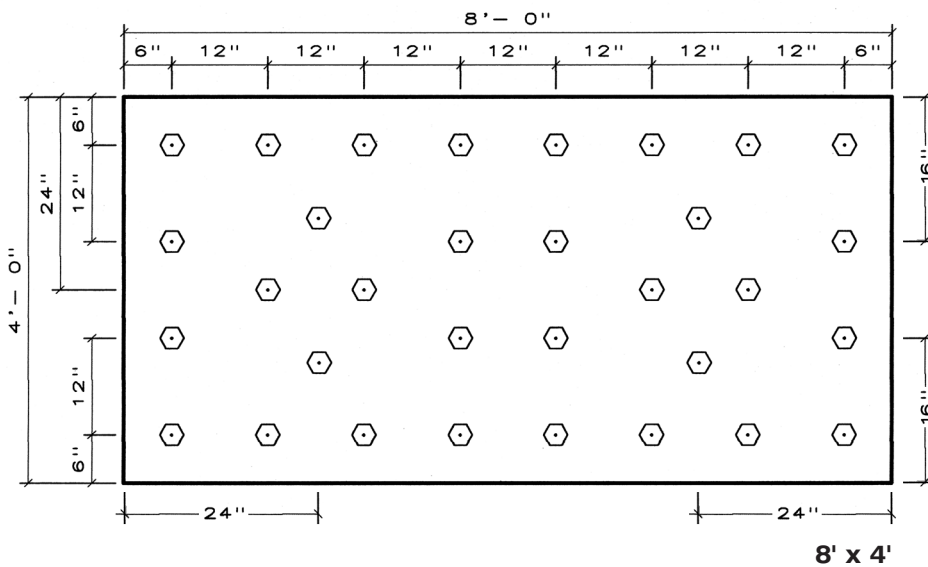
- FlintBoard ISO (and ISO-T)
- FlintBoard ISO WF (and ISO-T-WF)
- FlintBoard ISO Plus (and ISO-T Plus)
- FlintBoard ISO F
- FlintBoard ISO CV
- FlintBoard ISO NB
- FlintBoard ISO DD
- FlintBoard ISO Cold (and ISO-T Cold)



4' x 4'

Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



8' x 4'

C-2 Roof System Field-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems

For insulation thicknesses 1.5" or greater.

Notes

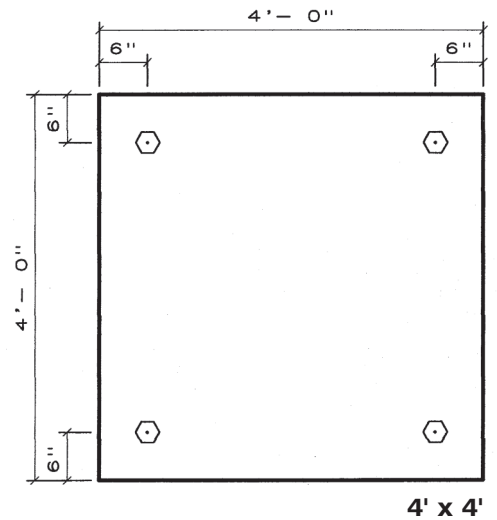
- Fasteners/Plates must be Factory Mutual Approved.
- 1 fastener per 4 square feet.

Deck Types

Steel – 22 Gauge Minimum
Structural Concrete
Cementitious Wood Fiber – For BUR and Mod Bit
Wood
Gypsum

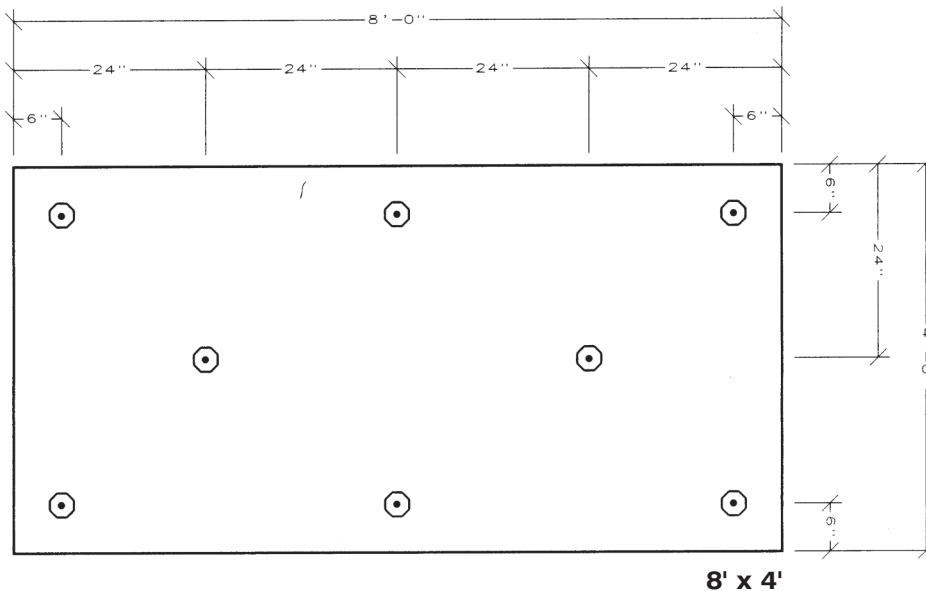
CertainTeed Products

FlintBoard ISO (and ISO-T)
FlintBoard ISO WF (and ISO-T-WF)
FlintBoard ISO Plus (and ISO-T Plus)
FlintBoard ISO F
FlintBoard ISO CV
FlintBoard ISO NB
FlintBoard ISO DD
FlintBoard ISO Cold (and ISO-T Cold)



Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



C-2 + 50% Roof System Perimeter-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems

For insulation thicknesses 1.5" or greater.

Note

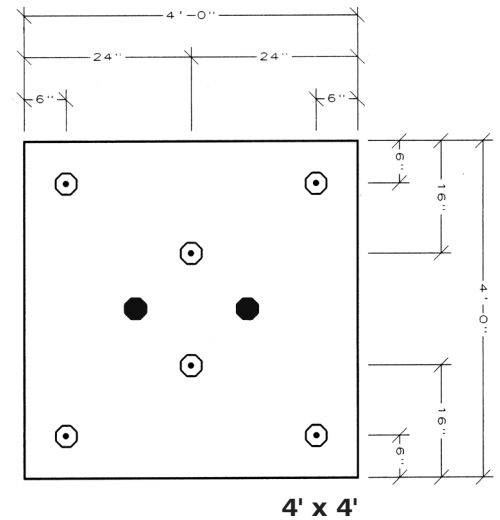
● Add the following Fasteners/Plates to achieve an FM 1-90 Approval.

Deck Types

- Steel – 22 Gauge Minimum
- Structural Concrete
- Cementitious Wood Fiber – for BUR and Mod Bit
- Wood
- Gypsum

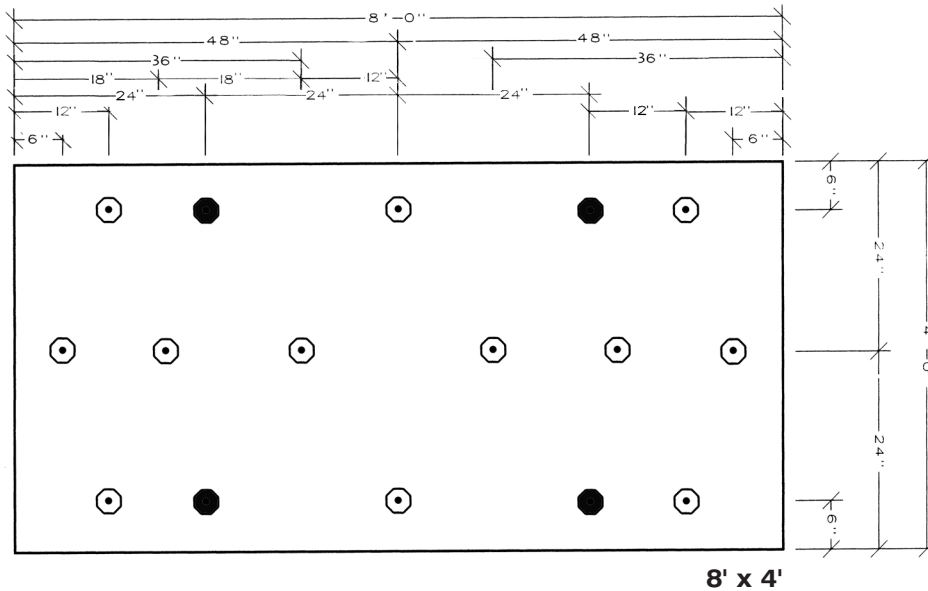
CertainTeed Products

- FlintBoard ISO (and ISO-T)
- FlintBoard ISO WF (and ISO-T-WF)
- FlintBoard ISO Plus (and ISO-T Plus)
- FlintBoard ISO F
- FlintBoard ISO CV
- FlintBoard ISO NB
- FlintBoard ISO DD
- FlintBoard ISO Cold (and ISO-T Cold)



Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



C-2 + 100% Roof System Corners-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems

For insulation thicknesses 1.5" or greater.

Meets I-90

Note

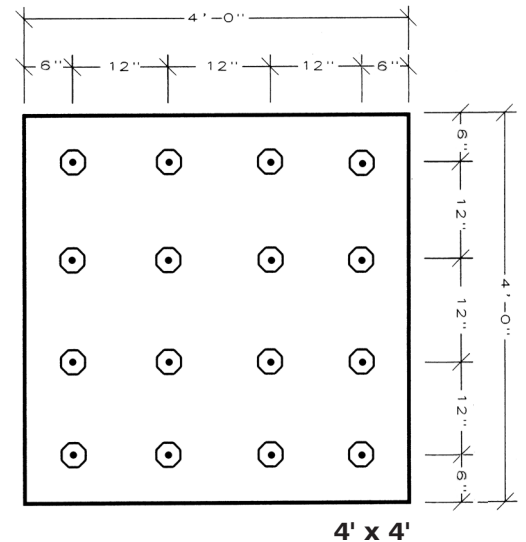
Fasteners/Plates must be Factory Mutual Approved.

Deck Types

- Steel – 22 Gauge Minimum
- Structural Concrete
- Cementitious Wood Fiber – for BUR and Mod Bit
- Wood
- Gypsum

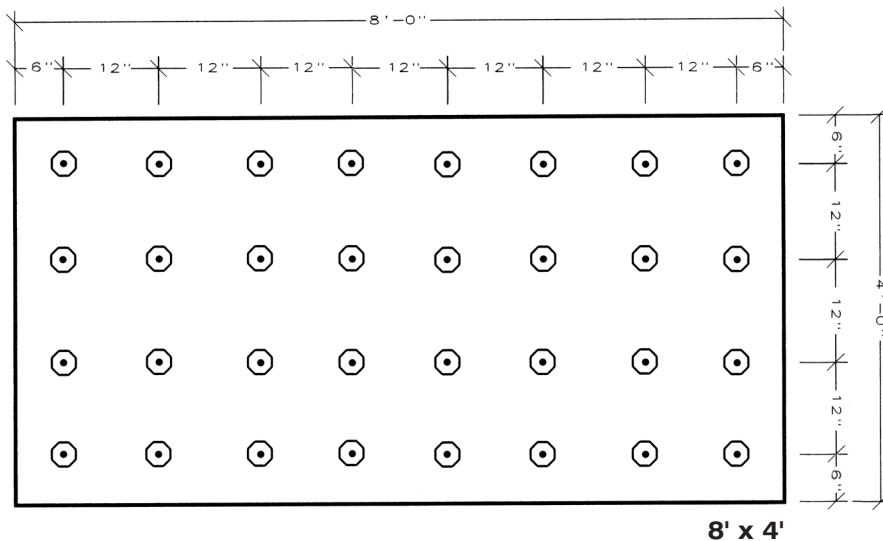
CertainTeed Products

- FlintBoard ISO (and ISO-T)
- FlintBoard ISO WF (and ISO-T-WF)
- FlintBoard ISO Plus (and ISO-T Plus)
- FlintBoard ISO F
- FlintBoard ISO CV
- FlintBoard ISO NB
- FlintBoard ISO DD
- FlintBoard ISO Cold (and ISO-T Cold)



Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



C-2 + 100% Roof System Corners-of-Roof Fastening Pattern

Built Up Roofing and Modified Bitumen Systems

For insulation thicknesses 1.5" or greater.

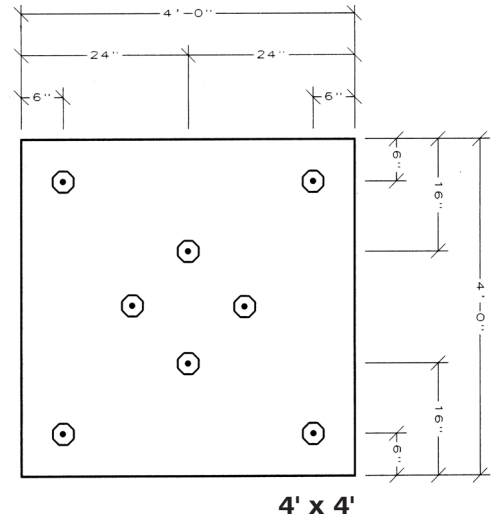
Meets I-60 and I-75

Deck Types

- Steel – 22 Gauge Minimum
- Structural Concrete
- Cementitious Wood Fiber – for BUR and Mod Bit
- Wood
- Gypsum

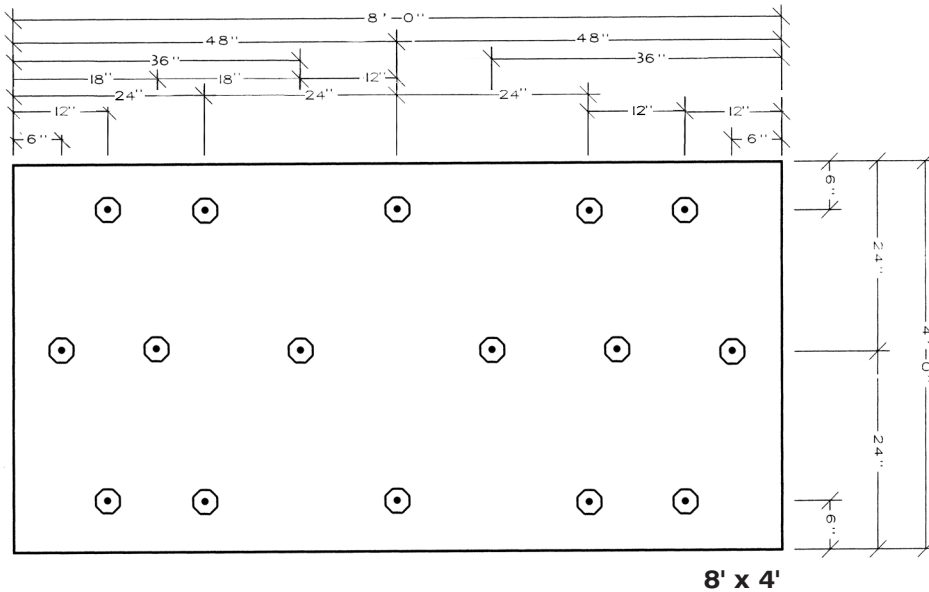
CertainTeed Products

- FlintBoard ISO (and ISO-T)
- FlintBoard ISO WF (and ISO-T-WF)
- FlintBoard ISO Plus (and ISO-T Plus)
- FlintBoard ISO F
- FlintBoard ISO CV
- FlintBoard ISO NB
- FlintBoard ISO DD
- FlintBoard ISO Cold (and ISO-T Cold)



Minimum thickness must be 1.5" to meet 1-60 or FM 1-90.

Refer to system manufacturer's listing for complete requirements to achieve FM Class 1-60 and 1-90 ratings.



NB-1 Roof System

FlintBoard ISO NB Fastening Pattern

Deck Types

Wood – Framing 24" o.c.

Concrete

Roof Types

Shingles

Slate

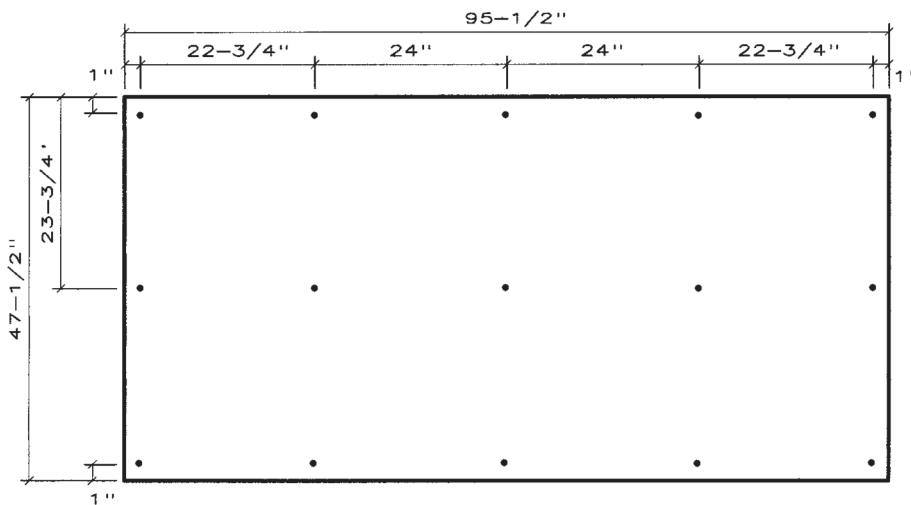
Tile

Standing Seam Metal

Notes

- FlintBoard ISO NB must be installed on a structural deck. Do not install directly to framing.
FlintBoard ISO NB is not a structural panel.
- The above fastening pattern meets FM 1-60 and 1-90 requirements where applicable.
- Fasteners must be FM approved. Use of CertainTeed panels SIP/WD for wood decks.
- For wood decks thicker than 1" the fastener must penetrate into wood deck by at least 1".
- For wood decks thinner than 1" the fastener must penetrate through the wood deck into the rafter whenever possible.
- For slate and tile roofs, contact manufacturer for recommendations.
- The above Fastening Pattern is for both routed and non-routed FlintBoard ISO NB.

For UL-90 rated assemblies under select metal roof systems, FM approved truss head fasteners and 2" diameter plates are required.



NB-2 Roof System FlintBoard ISO NB Fastening Pattern

Deck Types

Wood – Framing 16" or 32" o.c.

Concrete

Steel

Roof Types

Shingles

Slate

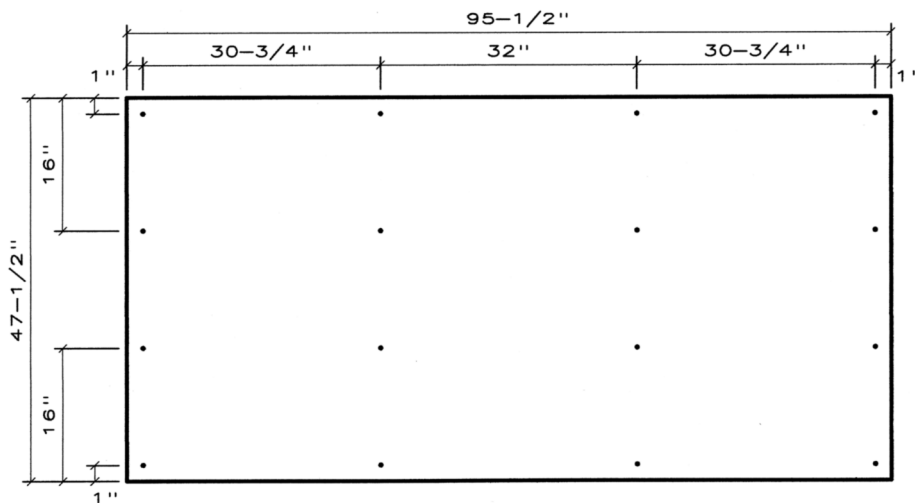
Tile

Standing Seam Metal

Notes

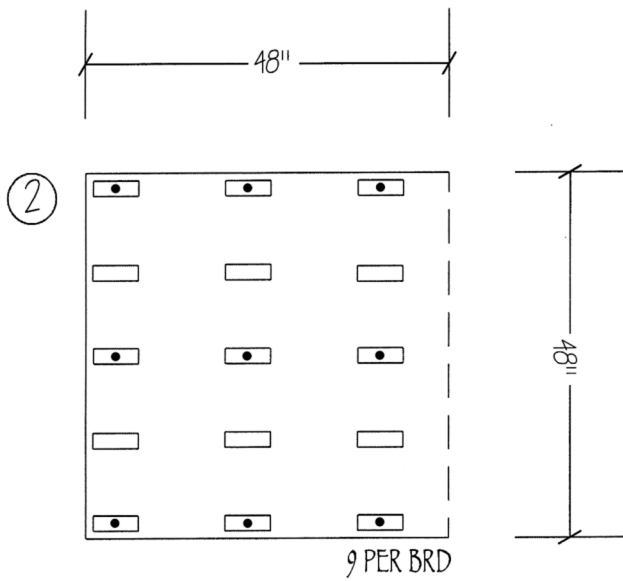
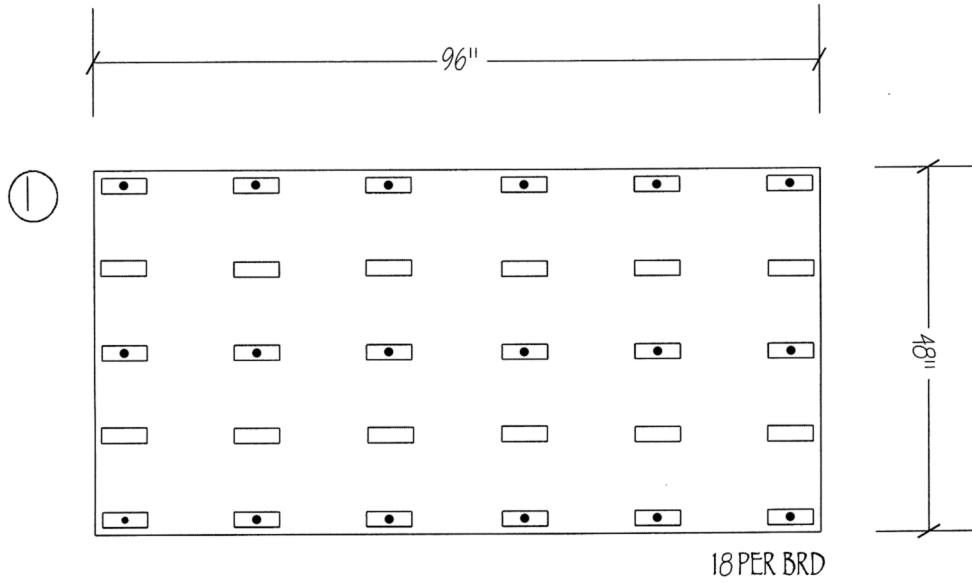
- FlintBoard ISO NB must be installed on a structural deck. Do not install directly to framing.
FlintBoard ISO NB is not a structural panel.
- The above fastening pattern meets FM 1-60 and 90 requirements where applicable.
- Fasteners must be FM approved. Use of CertainTeed panels SIP/WD for wood decks or SIP/SD for steel decks is required.
- For wood decks thicker than 1" the fastener must penetrate into wood deck by at least 1".
- For wood decks thinner than 1" the fastener must penetrate through the wood deck into the rafter whenever possible.
- For slate and tile roofs, contact manufacturer for recommendations.

For UL-90 rated assemblies under select metal roof systems, FM approved truss head fasteners and 2" diameter plates are required.




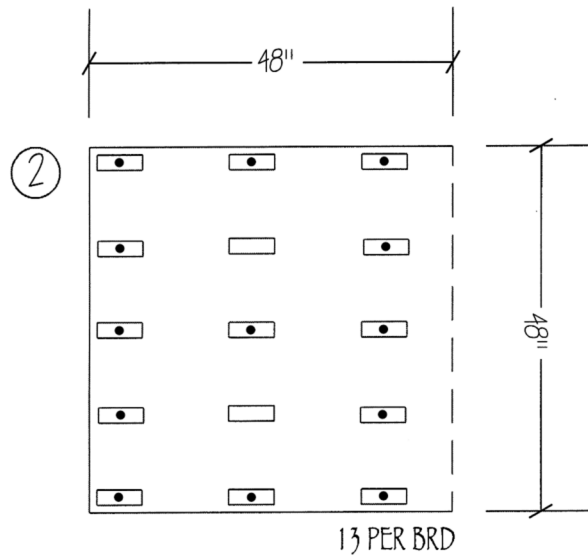
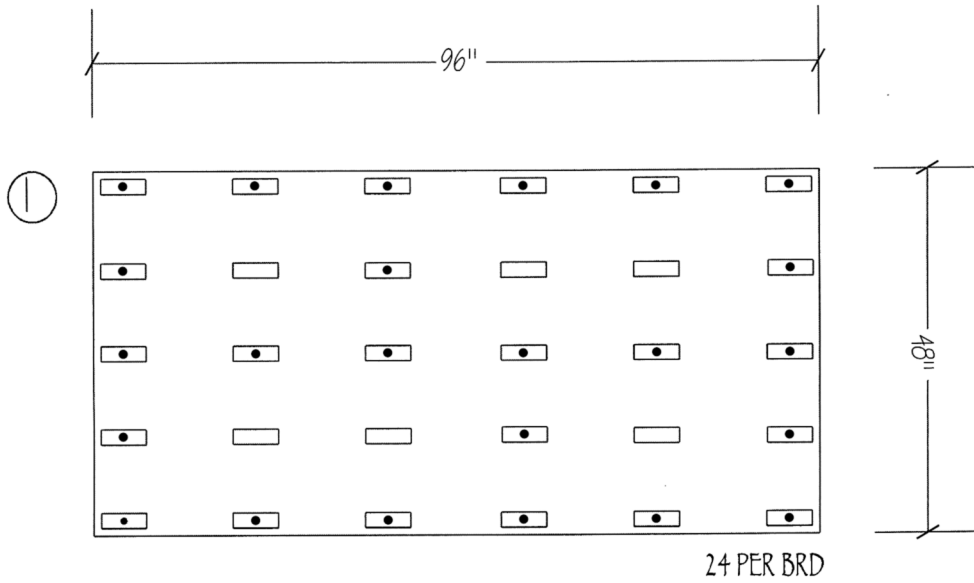
FlintBoard CV Fastening Pattern

 = Fastener for up to 7:12 Slopes (18 per board)



FlintBoard CV Fastening Pattern

 = Fastener for over 8:12 Slopes (24 per board)





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